REMARKS

By this Amendment, Claims 1-4, 6-8, 11-18, 20-24, 26, 29-31, 33, and 34 have been amended, and new Claims 35-40 added. Accordingly, Claims 1-40 are pending. Reconsideration of the May 5, 2003 Official Action is respectfully requested.

Initially, Applicants acknowledge that the Official Action withdraws the indication that Claims 27-28 are allowable.

1. Objection to Claims

The Official Action objects to Claims 32, 33, and 34 under 37 C.F.R. §1.75 as allegedly being duplicates of Claims 6, 27 and 28. Applicants respectfully submit that this assertion is in error for the following reasons.

Claims 1-4, 6-8, 11-18, 20-24, 26, and 29-31 are amended to change the term "intermetallic reagent" to "intermetallic compound reagent." This amendment does not narrow the scope of any one of these claims, but rather only makes express subject matter that was already implicit in them. As explained at page 1, line 23 - page 2, line 2, of the present specification, "intermetallic compounds," such as iron aluminide or titanium aluminide, or transition metal salts (e.g., Cu, Fe, Zn, Al, Ce, V sulfates and/or phosphates) can be used to remove gaseous components from a gas stream. At page 4, lines 17-18, of the present specification, "intermetallic powders," such as Fe_3Al, FeAl, FeAl, TiAl, NiAl, and Ni_3Al are described. Accordingly, it is clear that the terms "intermetallic compound" and "intermetallic" are used interchangeably in the present specification to refer to the same type of metal alloy.

Independent Claims 1 and 20, as amended, recite an "intermetallic compound reagent." Claim 6 and Claims 27 and 28 depend from Claims 1 and 20, respectively. Independent Claims 32-34 recite a "metal reagent," and not an "intermetallic compound reagent." In the context of this application, a "metal reagent" is different from an "intermetallic compound reagent." That is, a "metal reagent" can be a single metal (e.g., Fe), or it can be a metal alloy. In contrast, an intermetallic compound is one type of metal alloy (see page 1, lines 22-24, of the specification). A "metal reagent" can be a metal, a metal alloy different from an intermetallic compound, in addition to an intermetallic compound. Thus, Claims 32-34 are not duplicates of Claims 6, 27, and 28. Therefore, withdrawal of the objection is respectfully requested.

2. Rejection Under 35 U.S.C. §112, ¶1

Claims 1-34 stand rejected under 35 U.S.C. §112, ¶1, for the reasons stated at page 2 of the Official Action. The rejection is respectfully traversed.

The Official Action asserts that the originally filed specification does not support the term "intermetallic reagent." As explained above, this term has been changed to the term "intermetallic compound reagent" in some of the claims. The term "intermetallic compound reagent" is not recited in independent Claims 32-34. Thus, the rejection of Claims 32-34 under this ground of rejection is improper.

Regarding Claims 1-31, the terms "intermetallic" and "intermetallic compound" have the same meaning in the context of the application. In addition, the specification describes that an "intermetallic" or an "intermetallic compound" can be used to remove gaseous components from a gas stream, such as cigarette smoke, i.e., used as a "reagent."

As explained in MPEP §2163.02, a specification complies with the written description requirement of 35 U.S.C. §112, ¶1, when it conveys with "reasonable clarity" to those skilled in the art that, as of the filing date of the application, the applicants were in possession of the invention claimed. It is further explained that the subject matter recited in a claim need not be described literally (i.e., verbatim) in the specification in order for the disclosure to satisfy the written description requirement. Thus, there is no requirement that the term "intermetallic compound reagent" be literally described in the specification in order to satisfy the written description requirement. It is respectfully submitted that one having ordinary skill in the art would have recognized that Applicants were in possession of the claimed invention as of the filing date. The Official Action provided no evidence or reasoning supporting the contrary.

Accordingly, Applicants respectfully submit that the originally filed application provides support for the term "intermetallic compound reagent" recited in Claims 1-31. Thus, the specification is in compliance with the provisions of 35 U.S.C. §112, ¶1. Therefore, withdrawal of the rejection is respectfully requested.

3. Rejection Under 35 U.S.C. §112, ¶2

Claims 1-34 stand rejected under 35 U.S.C. §112, ¶2, for the reasons stated at page 3 of the Official Action. The rejection is respectfully traversed.

The Official Action asserts that "it is unclear what applicant considers an intermetallic reagent." As explained above, the term "intermetallic reagent" has been changed to "intermetallic compound reagent" in the claims. An "intermetallic compound reagent" is an intermetallic compound that can bind with gaseous components of a gas

stream to remove the gaseous components. It is respectfully submitted that one having ordinary skill in the art would understand the meaning of the term "intermetallic compound reagent" recited in the claims, in light of the specification. Accordingly, withdrawal of the rejection is respectfully requested.

Applicants note that Claim 32 has not been rejected over any prior art. Thus, it is believed that Claim 32 is patentable.

4. Rejection of Claims 1, 2, 13, 14, and 20-22 Under 35 U.S.C. §102

Claims 1, 2, 13, 14, and 20-22 stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 4,193,412 to Heim et al. ("Heim"). The reasons for the rejection are stated at page 3 of the Official Action. The rejection is respectfully traversed.

Initially, it is well established that a rejection for anticipation requires that *all elements* of the claimed invention be described in a *single* reference. Furthermore, an anticipating reference must describe the claimed subject matter "with sufficient clarity and detail to establish that the subject matter existed in the prior art and that such existence would be recognized by persons of ordinary skill in the field of the invention." *Crown Operations International Ltd. v. Solutia Inc.*, 62 USPQ2d 1917, 1921 (Fed. Cir. 2002). Heim fails to meet these requirements.

Claim 1, as amended, recites a filter comprising "an *intermetallic compound reagent* which binds with a gaseous component of a gas stream to remove said gaseous component from said gas stream" (emphasis added). Independent Claim 13, as amended, recites a method of manufacturing a filter, which is useful for removing a gaseous component of a gas stream, comprising "incorporating an *intermetallic compound reagent* in a filter, the

intermetallic compound reagent being effective to bind with a gaseous component of a gas stream sufficiently to selectively remove the gaseous component from the gas stream" (emphasis added). Independent Claim 20, as amended, recites a method of removing a gaseous component from a gas stream, comprising "passing the gas stream in contact with a filter comprising an *intermetallic compound reagent* which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream" (emphasis added).

An "intermetallic compound" is a chemical compound that has a fixed ratio of elements. Such compounds are composed of *two or more* types of metals. See the attached *McGraw-Hill Encyclopedia of Science & Technology*, vol. 9, pp. 301-302 (1987). Exemplary intermetallic compounds include the aluminides, such as Fe_3Al, FeAl, TiAl, NiAl, and Ni_3Al. See page 4, lines 17-18, of the specification. In addition, intermetallic compounds have stronger bonding than conventional alloys in which atoms are linked together by metallic bonds. Consequently, intermetallic compounds are characterized by increased melting points and strength. See also the attached page entitled *Intermetallic compounds*.

Heim discloses an additive for tobacco products that comprises an intimate mixture of at least two highly dispersed metal *oxides*, metal *oxyhydrates*, or mixtures thereof (see Abstract). The disclosed additive is a mixture of metal oxides and/or oxyhydrates of aluminum, calcium, magnesium, silicon, and/or titanium (column 1, lines 42-51, and column 2, lines 60-63). The disclosed metal oxides and/or oxyhydrates are *not*

intermetallic compounds. Heim does not disclose a filter that comprises an intermetallic compound reagent. Thus, Claims 1-2, 13-14 and 20-22 are patentable over Heim.

Withdrawal of the rejection under 35 U.S.C. §102(b) over Heim is therefore respectfully requested.

5. Rejection of Claims 1, 3, 12-13, 20, 23, 26-31, and 33-34 Under 35 U.S.C. §102

Claims 1, 3, 12-13, 20, 23, 26-31, and 33-34 stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 4,656,153 to Wennerberg ("Wennerberg"). The reasons for the rejection are stated at page 4 of the Official Action. The rejection is respectfully traversed.

Wennerberg discloses a porous active carbon containing a uniform distribution of a metal or metal-containing material (Abstract). Although Wennerberg discloses "any transition metal or metal of Groups IIIA, IVA or VA of the Periodic Table of the Elements or any combination thereof or a material containing any such metal or combination can be dispersed in the active carbon matrix" (column 7, lines 14-18), Wennerberg does not disclose or suggest that the "combination" may be a metallic alloy containing two or more different metals, much less that the "combination" may be an intermetallic compound. Wennerberg further discloses "*the* dispersed metal and *the* metal in the dispersed metal-containing material" (column 7, lines 19-20), and that the preferred metal-containing material is a metal oxide (column 7, lines 23-24).

Thus, Claims 1, 3, 12-13, 20, 23, 26-31 are patentable over Wennerberg.

Independent Claim 33, as amended, recites a method of removing a gaseous component from a gas stream, which comprises "passing the gas stream in contact with a *cigarette* filter comprising a metal reagent which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream ...." (Emphasis added.) Wennerberg fails to disclose or suggest passing a gas stream in contact with a cigarette filter to remove a gaseous component from the gas stream, as recited in Claim 33. Thus, Claim 33 also is patentable over Wennerberg.

Independent Claim 34, as amended, recites a method of removing a gaseous component from a gas stream, which comprises "passing the gas stream in contact with a filter comprising a metal reagent which binds with a gaseous component of the gas stream and removes said gaseous component from the gas stream, wherein ... *the gas stream is a smoke stream from a burning cigarette*" (emphasis added). Wennerberg fails to disclose or suggest removing a gaseous component from a smoke stream from a burning cigarette with a filter, as recited in Claim 34. Thus, Claim 34 also is patentable over Wennerberg.

Withdrawal of the rejection under 35 U.S.C. §102(b) over Wennerberg is respectfully requested.

6. Rejection of Claims 1-2, 7-8, 13-15, 20-22, and 30-31 Under 35 U.S.C. §102

Claims 1-2, 7-8, 13-15, 20-22, and 30-31 stand rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,083,579 to Vanin et al. ("Vanin"). The reasons for the rejection are stated at pages 4-5 of the Official Action. The rejection is respectfully traversed.

Vanin discloses an absorbing agent comprising a complex compound of ferrous iron and low-molecular ligands (see abstract). Vanin discloses a cigarette filter comprising a base of acetate, cellulose or acetate-cellulose fibers, and an absorbing agent comprising a complex compound of ferrous iron and a mono thiol-containing low-molecular ligand (column 2, lines 4-40). However, the complex compound of Vanin is not an intermetallic compound. Vanin does not disclose or suggest a filter comprising an intermetallic compound reagent, as recited in Claims 1, 13 and 20. Thus, Claims 1-2, 7-8, 13-15, 20-22, and 30-31 are also patentable over Vanin.

Withdrawal of the rejection under 35 U.S.C. §102(b) over Vanin is respectfully requested.

7. Rejection of Claims 3-5, 8-10, 12, 16-19, 23-26, 29, and 34 Under 35 U.S.C. §103

Claims 3-5, 8-10, 12, 16-19, 23-26, 29, and 34 stand rejected under 35 U.S.C. §103(a) over Heim. The reasons for the rejection are stated at pages 5-6 of the Official Action. The rejection is respectfully traversed.

Claims 3-5, 8-10, and 12 depend from Claim 1; Claims 16-19 depend from Claim 13; and Claims 23-26 and 29 depend from Claim 20. Heim fails to suggest an intermetallic compound. Accordingly, Claims 3-5, 8-10, 12, 16-19, 23-26, and 29 are patentable over Heim.

Claim 34 recites a method of removing a gaseous component from a gas stream, which comprises "passing the gas stream in contact with a filter comprising a metal reagent which binds with a gaseous component of the gas stream and removes said gaseous

component from the gas stream, wherein the metal reagent *is incorporated in or on a support material selected from the group consisting of silica gel, porous carbon and a zeolite* and said silica gel is incorporated with cellulose acetate fibers and/or polypropylene fibers, and the gas stream is a smoke stream from a burning cigarette" (emphasis added). That is, the metal reagent is *different* from the support material.

The Official Action asserts that Heim discloses amorphous silica support material for the metal reagent, citing to column 3, lines 67-68, of Heim. The Official Action acknowledges that Heim fails to disclose or suggest a silica gel, porous carbon, zeolite support material, as recited in Claim 34. However, the Official Action takes Official Notice, citing U.S. Patent No. 3,716,063 to Litzinger for allegedly disclosing that silica gel, carbon or zeolites are well-known support carriers. Applicants respectfully disagree with these assertions for the following reasons.

At column 3, lines 64-68, Heim discloses the preparation of an additive using silicon dioxide (average particle size 25 μm [see Example 1 at column 3, line 34]), and pyrogenic, amorphous, silicon dioxide (average particle size 12 nm). However, Heim does not disclose or suggest that the amorphous silicon dioxide is a *support* for the larger silicon dioxide particles. Rather, the amorphous silicon dioxide is an *additive* used to filter cigarette smoke. See Tables 1-7 of Heim (e.g., Table 3, *additive* (2), which is amorphous silicon dioxide). Thus, Heim fails to disclose or suggest the subject matter recited in Claim 34. Therefore, Claim 34 is patentable over Heim.

Therefore, withdrawal of the rejection is respectfully requested.

8. Rejection of Claims 4, 8, 9, 11, 17-19, and 24 Under 35 U.S.C. §103

Claims 4, 8, 9, 11, 17-19, and 24 stand rejected under 35 U.S.C. §103(a) over Wennerberg. The reasons for the rejection are stated at page 6 of the Official Action. The rejection is respectfully traversed.

Claims 4, 8, 9, and 11 depend from Claim 1; Claims 17-19 depend from Claim 13; and Claim 24 depends from Claim 20. For reasons stated above, Wennerberg fails to suggest an intermetallic compound. Accordingly, Claims 4, 8, 9, 11, 17-19, and 24 are patentable over Wennerberg. Therefore, withdrawal of the rejection is respectfully requested.

9. New Claims

Applicants respectfully submit that new dependent Claims 35-40 set forth novel and unobvious combinations of features, and also are patentable for at least the same reasons that claim 1 is patentable.

For the foregoing reasons, withdrawal of the objection and rejections, and prompt allowance of the application are respectfully requested.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: _____
Edward A. Brown
Registration No. 35,033

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

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